AUXILIARY

METHODS OF CURE

DONALD BAYNES.

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AUXILIARY METHODS OF CURE.

THE WEIR MITCHELL SYSTEM.
MASSAGE.
LING'S SWEDISH MOVEMENTS.
THE HOT WATER CURE.
ELECTRICITY.

BY

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PREFACE.

INTRODUCTORY CHAPTER.

IN the present day, there is a continual demand for something new, in medicine as well as in everything else; and in answer to this demand, several auxiliary methods of cure have of late years been introduced, or brought into prominence, as therapeutic agents. In my practice I have found some of them of the greatest possible value, and have achieved results, especially in chronic cases, quite beyond my most sanguine expectations; results that could never have been obtained by medicines alone. I do not in any way consider that these methods of treatment should entirely supersede the use of drugs, but rather act as subordinate aids thereto. Nor is it necessary in all cases to carry them out in the heroic manner so frequently advocated. In treating of these various "cures," I shall only give a short and simple account of each, referring the reader for a fuller description to the various treatises on these subjects, more particularly those to which I am especially indebted, *viz.*: "*Fat and Blood*" by DR. WEIR MITCHELL, "*Hiel-Gymnastik*" by DR. A. C. NEUMAN, "*Massage as a Mode of Treatment*" by DR. MURRELL, various works on the movement cure by DR. ROTH. In describing DR. WEIR MITCHELL'S system, I have thought it best to give the leading features in his own words.* "*Hot Water as a Remedy*" by H. W., (SIMPKIN, MARSHALL & CO.). In electricity I have consulted the works of DR. POORE, DOCTORS BEARD and ROCKWELL, etc.

DONALD BAYNES.

44, BROOK STREET, GROSVENOR SQUARE, W.
July, 1888.

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* "*Fat and Blood*," an Essay on the Treatment of certain forms of Neurasthenia and Hysteria; by S. WEIR MITCHELL, M.D., Philadelphia. *J. B. Lippencott & Co.*, 1884.

ERRATA

Page 10, line 6, *for* "this," *read* "these."
Page 31, line 22, *for* "was," *read* "were."
Page 32, line 15, *for* "was," *read* "were."
Page 36, line 4, *for* "prasping," *read* "grasping."
Page 36, line 15, *for* "expresses," *read* "expressed."
Page 60, line 3, *for* "or," *read* "on."
Page 69, line 10, *for* "pnenmogastric," *read* "pneumogastric."
Page 79, line 9, *for* "has," *read* "had."
Page 100, line 4, *for* "patash," *read* "potash."
Page 106, line 16, *for* "to," *read* "with."
Page 110, line 18, *for* "by," *read* "be."
Page 118, line 13, *for* "stabile," *read* "stable."
Page 122, line 5, *for* "encalyptus," *read* "eucalyptus."

CHAPTER I.

“Dr. Weir Mitchell's System.”

This is essentially a compound method of treatment, being a combination of several therapeutic agents.

1. Seclusion.
2. Rest.
3. Massage.
4. Electricity.
5. Dietetics.

The success by this mode of treatment has been enormous in a certain class of diseases, such as where the patient is debilitated, thin, and wanting both in blood supply and in nervous energy. Delicate and fragile women who have suffered or are supposed to have suffered from uterine or from spinal diseases. Over-worked men whose ceaseless worry has produced brain fag or gastric disorder. Patients who are anæmic and dyspeptic, suffering from constipation, disinclined to move or make any exertion, who are easily exhausted by any exercise however slight, always tired, constantly lying on the sofa and suffering from numerous aches and pains, chiefly in the back or in the abdomen. They are hysterical to a greater or less degree, sometimes so much so that they simulate various diseases, such as paralysis, heart affections, etc. They insist on being kept in a darkened room, the light is painful, the least noise or movement in the room makes them complain, moving seems to cause agony, a touch on the spine or stomach and they cry out. A mind intensely irritable, occupied with complaints. They are sleepless or say they are so, eating little, and sometimes refusing all food. This treatment is highly efficacious for those whose recovery from acute disease has been arrested, and who, instead of gaining flesh and strength, seem to stand still.

I will now give a brief description of the mode of procedure.

SECLUSION.

DR. MITCHELL makes it a fixed rule that these patients should be entirely removed from old surroundings, so as to thoroughly break up old habits. He removes them from the influence of those who have, from mistaken kindness, habitually given way to every foible and caprice. He says, "once separate the patient from the moral and physical surroundings, which have become a part of her life and sickness, and you will have made a change, which will be in itself beneficial, and enormously aid in the treatment which is to follow. Of course this step is not essential in such cases as are merely anæmic, feeble and thin, owing to distinct causes, like exhaustion from over-work, blood losses, low fevers, or nursing, . . . and when such persons are free from emotional excitement, or hysterical complications, there is no reason why the seclusion, needful to secure them repose of mind, should not be pleasantly modified in accordance with the dictates of common sense."

On the other hand, if the patient be hysterical or of an emotional temperament, an entire removal from her usual surroundings is necessary.

Again quoting from Dr. MITCHELL, ". . . but I am now speaking of the large and troublesome class of thin-blooded emotional women, for whom a state of weak health has become a long, and almost I might say, a cherished habit. From them there is often no success possible until we have broken up the whole daily drama of the sick room, with its selfishness and its craving for sympathy and indulgence." It is most essential that the nurse should be a complete stranger to the patient. She must be firm and kind, able to interest, yet capable of controlling, and she must see that the doctor's orders and instructions are carried out to the letter."

REST.

This is most important. Not the rest patients choose of lying in bed or on the sofa and receiving visits from sympathising friends, but absolute rest in bed under the control of a strange nurse, who will not permit reading nor writing nor any visitors ; then rest becomes an ordeal, and very glad the patient is when the term of rest is over.

Though absolute rest in bed has its therapeutic advantages, it has also its drawbacks, in lessening the appetite, interfering with the nutrition of the muscles, weakening the circulation, constipating the bowels, etc. This can be entirely overcome by Massage and by Electricity. When the time comes for the patient to begin to sit up, care must be taken that this is gradually done, beginning with a few minutes twice a day, and increasing by degrees as the patient's power returns. It is as well that before leaving the bed, she should first try to sit up ; by this means giddiness and vertigo (likely to occur if she gets up at once) may be avoided. When out-of-door exercise begins, the patient should at first take a very short walk, increasing the distance as strength returns.

MASSAGE.

This is the most important part of the course. By it and by Electricity the weakened muscles regain their tone, the circulation is improved, the nervous system is strengthened, and the whole machinery of life is restored and renovated. I cannot do better than quote in full from DR. MITCHELL's admirable little work, "*Fat and Blood*," the method in which it is to be carried out.

"After a few day of milk diet, with which my treatment begins, or from the outset, the masseur or masseuse is set to work. An hour is chosen midway between two meals, and the patient lying in bed, the manipulator starts at the feet, and gently but firmly seizes the skin, rolling it lightly between his fingers, and going carefully over the whole foot ; then the toes are bent and moved about in every direction, and next, with the thumbs and fingers, the little muscles of the foot are kneaded more largely, and the interosseous groups worked at with the finger tips between the bones. At last the whole tissues of the foot are seized with both hands and somewhat firmly rolled about.

Next the ankles are dealt with in like fashion, all the crevices between the articulating bones being sought out and kneaded, while the joint is put in every possible position. The leg is next treated, first as to the skin, then by deeper grasping of the areolar tissue, and lastly by industrious and more profound pinching of the large muscular masses, which for this purpose are put in a position of profound relaxation. The grasp of the muscles should be firm, and for the large muscles of the calf and thigh, both hands should act together, the masses of muscles being as it were, twisted around the bone, while the hands alternately contract upon them. In treating the firm muscles in front of the leg, the fingers or the two thumbs are made to roll the muscle under the cushions of the finger tips. At brief intervals the manipulator seizes the limb in both hands, and lightly runs the grasp upwards, so as to favour the flow of venous blood-currents, and then returns to the kneading of the muscles. The same process is carried on in every part of the body, and especial care is given to the muscles of the loins and spine, while usually the face is not touched. The abdomen is first treated by pinching the skin, then by deeply grasping and rolling the muscular walls in the hands, and at last the entire belly is kneaded with the heel of the hand in a succession of rapid, deep movements, passing around in the direction of the colon, while somewhat later the whole belly, relaxed by position, may be shaken by a rapid motion of the grasping hands."

After about a month or six weeks, Swedish movements (which I will fully describe later on) are to be substituted for the massage.

ELECTRICITY.

This is a general tonic, and in addition, when properly carried out, gives considerable exercise to the whole muscular system. As only exercise to the muscles, and the tonic effects of electricity are here required, the induced or faradic current is used. Each muscle of the leg is treated separately, the poles being moved about so as to ensure good contractions of the muscles. After the legs, the muscles of belly, back and loins are attacked, finishing with those of the chest and arms. At the close of the muscle-electrization the *seance* should be completed by general faradization, as follows: one pole is placed at the nape of the neck, and the other on one of the feet, after a time, from 10 to 15 minutes this pole is placed on the other foot ; or what would be equally beneficial, a sponge covered electrode, sufficiently large may be applied to both feet at the same time. The current from the primary coil is the one usually employed.

DIETETICS & THERAPEUTICS.

The diet is regulated according to the condition, history and disease from which the patient is suffering.

Generally at first the diet should be exclusively milk. The utmost care must be taken that all vessels which are used for milk should be perfectly cleansed (using boiling water). New milk skimmed, either warm or cold should be used, not boiled except when diarrhœa is present. It is to be given at least every two hours at first, in quantities not exceeding 4 ounces, and as the amount is increased, the time between may be lengthened to three hours ; if the patient be wakeful a glass of milk is to be left at the bed-side. It should be slowly sipped in mouthfuls ; should it cause great digust or nausea, a little tea, coffee or salt may be added at first. In some cases it is impossible for a patient to commence with entirely a milk diet, in which case the ordinary diet must be gradually decreased, and the milk increased till only milk is taken. If acidity ensue, the addition of a little lime water, barley water, or boiling water, will usually correct this trouble. At first the patient often loses weight, but this is regained and increased after a few days. The furred tongue (white and thick), the unpleasant taste in the morning, will pass away and need not be regarded. If there is constipation it may be relieved by appropriate means. In cases of pure obesity treated by this method, DR. MITCHELL says, "The person whose weight we decide to lessen, is placed on skim milk alone, with the usual precautions ; or at once we give skimmed milk with the usual food, and in a week put aside all other diet save milk and all other fluids. When we find what quantity of milk will sustain the weight, we diminish the amount by degrees until the patient is losing a half pound of weight each day, or less or more, as seems to be well borne. Meanwhile, during the first week or two rest in bed is enjoined, and later for a varying period rest in bed or on a lounge is insisted upon, while at the same time massage is used once or twice a day, and later in the case Swedish movements. At the same time, the pulse and weight are observed with care, so that if there be too rapid loss, or any sign of feebleness, the diet may be increased. In many such cases I allow daily a moderate amount of beef,–or chicken, – or oyster-soup,—more as a relief to the unpleasantness of a milk diet than for any other reason. When the weight has been sufficiently lowered we add to the diet beef, mutton, oysters, etc., and finally arrange a full diet list to include but a moderate amount of hydro-carbons. Meanwhile the milk remains as a large part of the food, and the active Swedish movements are still kept up as a habit, the patient being directed by degrees to add the usual forms of exercise."

. . . . .

"Cases of anæmia in women with excess of flesh have to be managed in a somewhat similar fashion, but with the utmost care. In such persons we have a loss of red globules, perhaps imperfect blood-pigment, weak heart, rapid pulse, and general feebleness, with too much fat, but not, or at least rarely, extreme obesity. The milder cases may profit by iron, with rest and very vigorous massage, but in old cases of this kind—they are, happily, rare—the best plan is to put the patient at rest, to use massage, restrict the diet to skimmed milk, or to milk and broths free from fat, and with them, when the weight has been sufficiently lowered, to give iron freely, and by degrees, a good general diet, under which the globules rise in number, so that even with a new gain in flesh there comes an equal gain in strength and comfort. As to other details the management should be much the same as that which I shall presently describe in connection with cases of another kind."

Though a useful mode of treatment in cases of excessive corpulence as above described, I do not think it the best, but consider that another and different regimen, the Hot Water Cure, (which I will describe later on), yields far better results. In the third class of patients described by Dr. Mitchell, there is no doubt of the great superiority of his plan, the successful results obtained being greatly in excess of other means; indeed in a great majority of cases it is the only treatment that holds out any prospect of success.

Quoting from DR. MITCHELL'S book "*Fat and Blood*," both his description and mode of procedure in these cases. ". . . Let us now suppose that we have to deal with a person of another and different type,—one of the larger class of feeble, thin-blooded, neurasthenic or hysterical women. Let us presume that every ordinary and easily attainable means of relief has been utterly exhausted, for not otherwise do I consider it reasonable to use so extreme a treatment as the one we are now to consider. Inevitably, if it be a woman long ill and long treated, we shall have to settle the question of uterine therapeutics. A careful examination is made, and we learn that there is decided displacement. In this case it is well to correct it at once and to let the uterine treatment go on with the general treatment. If there be bad lacerations of the womb or perineum, their surgical relief may await a change in the general status of health,—say at the fourth or fifth week. If there be only congestive or other morbid states of the womb or ovaries, they are best left to be aided by the general gain in health ; but in this as in every other stage of this treatment it is unwise, and undesirable therefore, to lay down too absolute laws. Having satisfied ourselves as to these points, and that rest, etc., is needful we begin treatment, if possible, at the close of a menstrual period, because usually the monthly flow is a time at which there is little or no gain, and by starting our treatment when it is just over we save a week of time in bed.

The next step is, usually, to get her by degrees on a milk diet, which has two advantages. It enables us to know precisely the amount of food taken, and to regulate it easily; and it nearly always dismisses, as by magic, all the dyspeptic conditions. If the case be an old one, I rarely omit the milk; but although I begin with 3 or 4 ounces every two hours, I increase it in a few days up to two quarts, given in divided doses every three hours. If a cup of coffee given without sugar on awaking does not regulate the bowels, I add a small amount of watery extract of aloes at bedtime; or if the constipation be obstinate, I give thrice a day one quarter of a grain of watery extract of aloes with two grains of dried ox-gall. I find the simple milk diet a great aid towards getting rid of chloral, bromides, and morphia, all of which I usually am able to lay aside during the first week of treatment. Nor is it less easy with the same means, to enable the patient to give up stimulus; and I may add that in the treatment of the habitual hard drinker the milk treatment is of admirable efficacy. As I have spoken over and over again of the use of stimulus by nervous women, I should be careful to explain that anything like great excess on the part of women of the upper classes, in this country at least, is, in my opinion, extremely rare, and that when I speak of the habit of stimulation I mean only that nervous women are apt to be taught to take wine or whiskey daily, to an extent that does not affect visibly their appearance or demeanour.

Meanwhile, the mechanical treatment is steadily pursued, and within four days to a week, when the stomach has become comfortable, I order the patient to take also a light breakfast. A day or two later she is given a mutton chop as a mid-day dinner, and again in a day or two, she has added bread and butter thrice a day; within ten days I am commonly able to allow three full meals daily, as well as three or four pints of milk, which are given at or after meals, in place of water."

". . . At the close of the first week I like to add one pound of beef, in the form of raw soup. This is made by chopping one pound of raw beef and placing it in a bottle with one pint of water and five drops of strong hydrochloric acid. This mixture stands on ice all night, and in the morning the bottle is set in a pan of water at 110° *F.* and kept two hours at about this temperature. It is then thrown on to a stout cloth and strained until the mass is nearly dry. The filtrate is given in three portions daily. If the raw taste prove very objectionable, the beef to be used is quickly roasted on one side, and then the process is completed in the manner above described. The soup thus made is for the most part raw, but has also the flavour of cooked meat."

THERAPEUTICS.—After ten days of this treatment, two to four ounces of *fluid malt extract.* In some cases *cod liver oil* is advised half-an-hour after eating three times a day; if it causes nausea or lessens the appetite, it may be used in the form of enema three times, combined with some pancreatic emulsion. *Cod liver oil* is usually administered in too large quantities for proper assimilation as may be shown by the fact that globules of it can frequently be seen in the excreta. Generally one teaspoonful, never more than a desert-spoonful should be administered to adults; and the quantity for very young children should be counted by drops. As soon as the patient begins to take food, *iron* is given. The preparations I usually advise are *Flitwick water*, *ferrum redactum*, *sanguis bovis exsiccata*, and the *pyrophosphate of iron.* Burroughs and Welcome's Extract of Malt is a good sound preparation. For amenorrhœa, I give *aletris*, *pot permang*, or *pulsatilla*, unless some other emmenagogue seems specially indicated. For constipation, I find medicines like *sulphur*, *nux vomica*, *bryonia* or *hydrastris* sufficent; in some cases I have (if necessary) given a dose of *Prussian liquorice powder*, which I prefer to preparations of aloes. In many cases, however, a little fresh fruit or stewed prunes are sufficient to relieve the constipation. *Cascara* also is a useful preparation. Most medical men have, however, their own favourite aperient. Perhaps the best means of overcoming constipation is by injecting a teaspoonful of *glycerine* (Price's) on first rising in the morning; this will ensure a comfortable and normal relief. A special syringe is required.

In illustration, I here give two or three typical cases where this treatment has proved perfectly successful in my practice.

M—— G—— was a cook in a large household. Her illness followed some disappointment in a love affair. She then changed her place. Shortly after she caught a severe cold, which she seemed unable to throw off. Her appetite failed, and her cough increased. The sudden death of a sister, under very painful circumstances, brought things to a climax. She coughed up (she says) a quantity of blood, and was so ill that she was sent to a Hospital, where she stayed two or three months, when she was dismissed as incurable. She remained at home for about two years, unable to be moved out of bed for more than a few minutes. Her only nourishment was a little tea, milk and beef tea. From time to time she brought up blood. Towards the end of the two years one of her hands became affected with a pseudo-paralysis, and her fingers were drawn down. She complained of much pain, and was supposed to be sinking fast. The vomiting of blood went on, and she was said to be suffering from ulceration of the stomach.

This was the condition of things when I was asked to see her, and take up the treatment of her case. I immediately had her removed from home, placed in bed in a large airy room, and under the charge of a good nurse and masseuse. Before the end of the week she was able to take a bath without the assistance of the nurse, and at the end of three weeks was sent away for change of air, still in charge of the nurse ; at that time she could walk a mile easily, and without fatigue. After three or four months she was able to take a situation, and though she has a good deal of hard work she has stayed in her place for quite two years. She remains in good health, giving every satisfaction to her employers.

Miss ——, after a long and severe illness, gradually became more and more "run down," and unable to move about, until finally she was only able to get from the bed to a sofa, and back again. She seemed to be in constant pain. She could not bear the light, and so lived in a more or less darkened room. She became weaker, and remained always in bed, occasionally resting an hour or two on the lounge. She scarcely ate anything, living chiefly on tea, beef tea, or a little milk. She was very thin, and seemed to be gradually wasting away, so much so that her relatives only thought of how to make her most comfortable for the short time she was expected to live. By the advice of some friends I was called in. After a careful examination finding no organic disease, I decided to put this patient on the WEIR MITCHELL TREATMENT. This was followed by the happiest results, and terminated in a complete cure. After three weeks she was able to go out with the nurse for a walk, and a fortnight later I sent her to the sea-side, where she had sea baths, good long walks, and drives. In two months after the commencement of her treatment, I dismissed her as cured. Her appetite was good, she had regained her strength, weight, and natural appearance. It is now three or four years since this occured, and she has remained in good health.

Mrs. R——, 37 years of age, has had several children. Her ill health was caused in the first place by over-nursing, and was increased by uterine trouble and over-work. When I first saw her she was very low-spirited, unable to get about, and was a martyr to dyspepsia and to constipation. The uterine trouble was attended to. She was then put on milk diet, and in a few days massage and electricity were added. This patient improved very quickly, and never had a single drawback or relapse. She is now well, and able to look after her household duties, which she had been unable to perform for several years.

It may perhaps interest the reader to have a detailed record of one of the cases. I will give that of Mrs. R——, being the most recent. Her treatment began on May 12th, 1887, with a cup of coffee at 7.30 a.m., followed by a tumbler of milk every two hours.

May 13th.—The same diet.

May 14th.—Massage was ordered at 9 a.m. and 8 p.m. and electricity about mid-day; continued same diet.

May 15th, 16th, 17th & 18th.—The same diet and treatment. I may mention that a dose of *Prussian liquorice powder* was given when necessary.

May 19th.—In addition to above diet, 4 ozs. of raw soup was given three times a day. The patient by this time had greatly improved in health and spirits ; this diet treatment was continued for another week, when she was allowed bread and butter for breakfast and at 5 p.m., with a cup of weak tea.

May 28th.—A chop with green vegetables was ordered at noon and six o'clock in the evening ; the bread and butter was continued and the quantity of milk lessened. This was continued for 3 days.

June 1st.—The following full diet was given : coffee and bread and butter 7.30 ; breakfast about 9, a chop and more bread and butter with a tumbler of milk. The milk and raw soup was continued, and for dinner about 6.30 or 7 she had meat, vegetables, rice pudding and stewed fruits.

She now began Swedish movements instead of the massage, and in another week she was allowed to have ordinary diet with the addition of three tumblers of milk (peptonised) a day, and was sent to Brighton, where she stayed a fortnight and then returned home well, and has remained so ever since.

* * *

CHAPTER II.

"MASSAGE."

This term is probably derived from the Arabic "Mass'h, to press softly."

Massage consists of a series of manipulations, many of which are only varieties of some of "LING'S Passive Movements." DR. WEIR MITCHELL has brought this valuable therapeutic agent into prominence, and rescued it from the hands of charlatans. There is no doubt that massage or rubbing is of great use in many diseases. It is, however, but the threshold of the scientific and more perfect system of LING; and although massage benefits those suffering from many chronic diseases, it often stops short there, and the cure has to be completed by LING's method. The Persians, Arabs, and Indians are adepts at massage; their manipulations vary from those in vogue in this and other civilized countries.

The advantages of massage are also recognized by grooms in this country for many disorders of horses. The Persians, Arabs, and Indian Syces are all adepts at this method of treating their animals. A friend of mine, an officer, who has spent several years in India, has told me of many interesting cases where massage has had a wonderful restorative effect on both man and beast.

The following is a part of his experience in India and in England: "Every bearer is an expert at hand-rubbing. Many a time after a hard day's riding or shooting I have lain down on a camp bed, thoroughly exhausted, my bearer has squatted on one side of it and my Syce (groom) on the other. These two have then rubbed me all over, pressing their knuckles into my flesh, pulling my fingers and toes, prasping and shaking the muscles of my neck, back, legs, arms, and abdomen, till all the lassitude and sense of oppression caused by the sun have gone. I have seen an exhausted coolie lie on the ground (after a long day's march), with his face downwards, and another coolie has stood on his back, with his bare feet, and walked about all over him, kneading him with his feet for ten minutes or so, or until the patient expresses himself as all right. He would then rise, take a pull at his hubble-bubble (native pipe) and then set to work to cook his own food, quite cheerily. Grooms in India are extremely good at this sort of work.

I have seen a horse affected by the sun, his eye dull, head and neck hot, no appetite, etc., etc. (The next symptom of sunstroke is often a sort of strangulation, found on *post mortem*, to be caused by the blood coagulating in all the big veins of the neck and throat).

The Syces have set to work at hand-rubbing the head, neck, throat, and spine, with occasional dashes of water from a sponge in the animal's face, until his eye has brightened a little and he was able to swallow a little gruel or mash. Rest in a cold dark stable and repeated rubbings have completed the cure.

English grooms are also aware of this method of treatment, and shew great skill in its use. Their superior size and strength give them a great advantage over the Indian Syces. The other day, after a hard and wet day's hunting, my horse was thoroughly done up. A big groom, in a small Inn stable, literally hustled it into life and activity again, pulling its ears after the manner of a milkmaid milking a cow, rubbing its cheeks, loins, back, and stomach with the whole bare forearm, and occasionally sponging the nostrils and neck with water. The horse quickly regained its vigour and appetite.

Steady rubbing with the hand or hot flannel, is one of the best remedies for colic and other violent abdominal derangements in horses.

In men, cramp at night in hot countries is very common, and native Indians will charm it away in a few minutes. I have often been sent to sleep, when troubled with neuralgia after fever, by my servant rubbing or shampooing my head."

In the East, cases of sunstroke, (so often fatal), are frequently cured by this means, and many a valuable life has been saved, or the ill effects of the sunstroke averted, by skilful massage.

In this country, only the rich, or those able to pay, can have the benefit of this most valuable and pleasant cure, whereas in the East, especially in Persia, it is a luxury and comfort to every class. As everyone, however poor, understands the art, even children may be seen manipulating each other. All good servants can shampoo their master or mistress when required to do so.

Massage as practised in Europe varies more or less from the massage of the East. It is usually understood to consist of four or sometimes more forms or varieties of manipulation: 1. *Friction;* 2. *Effleurage;* 3. *Tapotement;* and 4. *Petrissage.*

1. *Friction.* BEUSTER defines this movement thus: "The finger-tips of one hand held at right angles to the axis of the limb, rub across and across in narrow ellipses, while the fingers of the other hand stroke parallel to the axis of the limb." The results produced vary according to the strength or rather force employed by the manip-

ulator. If lightly performed it has a soothing effect, and will often induce sleep and relieve a nervous headache. If more forcibly carried out, it is a good stimulating tonic, reddening the skin and producing warmth. It is usually accompanied by *effleurage*.

2. *Effleurage*, according to BEUSTER: "consists of slow gentle strokes in a centripetal direction along the course of the veins and lymphatics, made with the palm of the hand, etc." *Frictions* and *effleurage* so run into each other that they may almost be considered as one movement where pressures with the palm of the hand or soft cushion of the thumb, alternate or run into frictions performed with the fingers.

3. *Tapotement*. This consists of tappings or knockings performed with the hand, fingers, or some instrument on the patient's body. If performed with the hand, the best method is to keep the fingers loose apart, and then strike

with the edge of the little finger and ulnar border of the hand; this causes the other fingers to fall on the inner border of the little finger, producing a sort of prolonged jar. It may also be done by striking with the knuckles and palm of the hand when the fist is partially closed.

The mechanical means are many, as an India rubber ball at the end of a long piece of cane or stick, or by a long piece of India rubber divided into fingers at the striking end; probably the most perfect way of administering tapotement is by means of an induced current battery, arranged to give slow interruptions, sixty to eighty or one hundred and fifty in a minute, this produces full hammer-like blows. DR. MORTIMER GRANVILLE'S Percuteur is another method producing a similar vibratile result.

4. *Petrissage*, though the last, is of more importance than all the others

combined. It is a form of kneading, and may be performed by picking up muscle or other tissue with the hands or fingers and subjecting the parts to pressure, and at the same time imparting a rolling movement to it; both hands should move in an opposite direction and work at the same time. By this means the part to be acted upon receives a thorough kneading.

One of the best descriptions of massage is given by DR. WEIR MITCHELL in his little book, "*Fat and Blood*," a full description of which has already been given in his own words on page 11.

Massage has been found of great service, especially when combined with electricity in infantile, hysterical and some other forms of paralysis, locomotor ataxia, spinal irritation, rheumatism, lumbago, constipation, nervous exhaustion, neuralgia, etc. It has also been found useful in sleeplessness, nervous irritability, fidgets, and in nearly all chronic diseases, especially those of a neurasthenic character.

Cases illustrative of this method of treatment will be described later under "Swedish Movements."

CHAPTER III.

LING'S CURATIVE GYMNASTICS,

SOMETIMES CALLED

SWEDISH MOVEMENTS, &c.

THIS method of treatment was introduced by PETER LING, about the beginning of this century. He suffered so severely from rheumatism of the right arm that it became useless; this he cured by practising fencing, which gave him the idea of treating chronic disease by exercises which he eventually systematised, and introduced as a scientific method of treatment. He urged that his system of active movements should form part of a soldier's drill. He met with much opposition, and it was many years before his labours obtained any adequate reward. Eventually the government granted him a sum of money to fit up a gymnasium, where he lectured on hygienic gymnastics. His lectures soon attracted great attention, and finally he received a government appointment, and had the satisfaction of seeing his system recognised as a part of military drill. In addition he had the gratification of seeing his disciples carrying out his system as a method of cure in disease. The curative movements are of three kinds : passive, semi-active and active.

I. The passive movements consist of a series carried out while the patient remains quiet, all the movements being performed by the operator.

II. The semi-active on the other hand necessitate the co-operation of the patient with the operator in the movements.

III. The active movements are carried out by the patient only, under the guidance or direction of the operator.

I.—PASSIVE MOVEMENTS. These consist of the following series of manipulations :—

1. *Frictions.*
2. *Fullings.*
3. *Percussions.*
4. *Rotations.*
5. *Vibrations.*
6. *Pressures.*
7. *Ligatures.*
8. *Flexions.*
9. *Massage.*

1. *Frictions.*—There are several kinds of friction.

The gentle surface frictions : these are performed with the palm of the hand, in the direction of the nerve course, they act on the cutaneous nerves, the subcutaneous glands, and capillaries. They are useful in soothing irritation, allaying pain, and in paving the way for more direct methods of treatment, which often have to be given up owing to the hyper-sensitiveness of the patient. The gentle surface frictions may be applied to any portion of the body, where there is pain or irritation. Their power is greater when applied over the great nerve centres and spine. Over the solar plexus, they arrest chronic sickness and soothe the pain of dyspepsia. Applied along the spine, they invigorate and strengthen the system, allay pain, and in conjunction with other passive movements, help to disperse congestion and subdue chronic inflammation and irritation. When applied to the head, they are useful in brain-fag, hyperæmia, and congestion, especially surface congestions. They are very refreshing, soothing, and grateful to the patient. The chief characteristic of these gentle passive frictions is that they soothe irritation and relieve pain wherever it may be situated.

Frictions with pressure. These act on the more deeply-seated tissues, particularly on the lymphatics and the smaller veins. LING especially points out that they should be performed against the course of the veins, which produces, according to NEUMANN, a momentary retardation in the upward flow of the blood towards the heart, the secondary effect of which is an increase in the rapidity with which the blood is propelled onwards. Besides the immediate effect upon the veins, the subjacent arteries are also affected, though in a minor degree; the blood in them being urged towards the extremities, and thus onward to the remote arterial ramifications. These frictions are used in a great variety of ways. Their effect is modified, intensified, or altogether changed by the various positions in which the patient is placed, the muscles of a part being relaxed or extended, according to the results desired. Again, the slowness or rapidity with which these frictions are carried out, has much to do with their results, slow frictions being more sedative and strengthening, rapid ones more stimulating and reviving. This will be seen to correspond to some extent with the use of electricity, in which, while both currents possess sedative and tonic effects on the one hand and stimulant and reviving effects on the other, in the continuous current the former, in the interrupted current the latter, preponderate. One great advantage of these frictions is that no person is too delicate, too sensitive, or too ill to tolerate them. They often form the bridge across which the physician may pass to put into practice other methods of treatment, which, because of extreme sensitiveness, his patient had hitherto been unable to bear.

2. *Fullings.* — These movements constitute one variety of frictions. We have fullings of arms, thighs, legs, spine, loins, etc. They are confined to the thick or central parts of the muscles, and not to their tendons. In fullings of the legs and the arms, the limb is taken between the palms of the hands, which are opposite to one another. The operator now rotates the whole mass of the muscles around their bony axis. In fullings of the spine and loins, etc., the operator, placing one hand firmly on either side and keeping the hands fixed, moves the muscles up and down over the bony structures. In frictions the hands are moved over the surface, while in fullings the hands are kept stationary, and the muscles of the patient are moved about. These movements are most useful in wasting of the muscles, in some forms of paralysis, and in various congested states of the muscles.

3. *Percussions.*—These, when applied to muscular parts of the body, tend to impart vitality and tone to the muscles, to stimulate the nerves, and to increase capillary circulation. Applied to the spine, their object is to encourage the flow of the nerve current in the spinal nerves, and to increase the circulation in the spinal cord, and they tend generally to strengthen the vertebral column by the slight vibration which they cause. Applied to the occiput, percussions are of service in acting on the brain tissue by promoting the circulation. In hyperæmia, these percussions properly applied are of considerable service. They are of great use in chest affections, when applied over the sternum and chest walls, and are used by Ling and his followers in phthisis, bronchitis, asthma, etc. These percussions must be performed by a well practised hand, for although they should be effective and impressive, they

must be very lightly applied. The hand requires to have the property of rebounding as though all the fingers were on springs.

4. *Rotations.*—LING employs rotations to any part of the body where they can be carried out, and the manner in which he has arranged these movements, the patient being in a passive condition, shows the greatest ingenuity, as by his method rotations and semi-rotations can be effectively and easily applied to all the joints of the body, as well as the head. We must bear in mind that this kind of movement is contra-indicated in cases where any inflammation is present. *Rotations* of the joints tend to induce re-sorption of any excess of synovial fluid (as in housemaid's knee), while in chronic arthritic cases, where the lubricating fluid is deficient or viscid, they help to excite its flow or promote its fluidity. They tend to break up recent or slight

adhesions. The effect is distinctly tonic, restoring the part to a normal condition, whether erring by excess or defect. The fibrous tissue in and about the joint is strengthened by alternate tension and recoil. The ligaments are invigorated from the same cause, and the circulation is powerfully influenced and improved.

Rotations of the body consist in firmly securing the patient from the hips downwards to a suitable couch, the upper part of the body which projects beyond the couch is supported in a recumbent posture by the operator, who describes a series of rotations in which the patient necessarily takes a part, though a passive one.

Body rotation strengthens and improves the digestive functions, promotes circulation in the stomach and intestines, increases the peristaltic action of the bowels, and encourages the secretion of the gastric juice. Though this is one of the passive movements, still when the strength of the patient admits of it, a slight resistance of the abdominal muscles may be permitted.

Rotations of the head. In this case the patient is placed on the couch, face downwards, and the body is fixed as far as the shoulders, only the head and neck projecting beyond the couch. The head is then rotated by two operators; the patient being entirely passive. This important exercise is used where the cerebral circulation is faulty, as in hyperæmia, cerebral anæmia, chronic headaches, etc. Thus the glands, arteries, veins and muscles about the head and neck are all acted upon according to the will of the operators. The passive thigh rotations are very useful in muscular stiffness in and around the hip joint, also in strengthening the glandular system and nerves of the groin; while by producing a mild action upon the lower intestines, they have been found very effective in chronic constipation. Finally combined with the half active exercises, they have a beneficial and stimulating effect on the sacral muscles and nerves. This passive rotation of the thighs stands alone in its powers of usefulness ; no kind of manipulation with the hand or any active exercise of the hip joint would be productive of the same amount of benefit. It must, however, be remembered that unless the operator be skilful, much harm may be caused by these movements.

VIBRATIONS. — Vibrations may be applied to almost all parts of the body. The vibrations have their origin in the hands and arms of the operator, who grasps the limbs or has the hands in close contact with the patient, and thus transmits the vibration to him or her. Vibrations are used largely as a nerve tonic, and serve to rouse and stimulate the nerves, especially where a low state of vitality prevails. They also have a stimulating effect on the circulation, and assist in giving tone to debilitated and partially atrophied muscles ; they are very effective in getting rid of effete and waste tissue or material, thus acting beneficially on morbid deposits and congested conditions of the body. They are found most useful in some heart and lung complaints.

Vibrations of the arms stimulate the cervical and brachial nerves, a vibration applied to the outstretched arm is felt in the pectoral muscles, and its effect extends even to the lungs, though in a modified degree, and can be distinctly felt by the patient. They tend to strengthen the nerves and capillary circulation of the lungs. Their beneficial effect being transmitted even to the minutest capillaries and the ultimate air cells.

Vibrations of shoulders and loins are also used to produce similar effects in the lungs. In vibrations of the shoulders, the operator stands behind the patient, who is in a reclining posture, and places a hand under each armpit, the vibration is then given, accompanied by a lifting motion; by this means the lungs receive the vibration while they are lifted or stretched. This movement is of peculiar value in asthma.

Vibration of the loins is carried out by the operator, standing in front of the patient, who is in a half-reclining posture. Passing the hands under the body, one on either side above the fourth and fifth ribs, the patient is then raised so as to arch the spine, and in this position the vibrations are transmitted to the patient. This movement especially affects the lower lobes of the lungs. Vibrations of the hypochondria and subcostal regions have a beneficial action on the liver, spleen, and intestines. Though vibrations are very difficult and fatiguing for the operator, they are *most* important, as they enable the operator to act on the deep-seated structures or organs and those parts which are enclosed in bony structures, and produce results that no amount of surface rubbing or kneading (the so-called massage) can effect.

Occipital vibrations are useful in sluggish cerebral circulation, vertigo, drowsiness, etc.

Vertebral vibrations are performed by placing the outer margin of the hands and little fingers, one on either side of the spine, and then vibrating the hands very delicately and shortly. If the hands are well placed and the vibrations skilfully performed, a very beneficial and tonic effect is transmitted to the spinal cord.

Intestinal vibration is carried out by placing the palms of the hands firmly but lightly on the surface of the abdomen, and then vibrating. This vibration has two entirely opposite effects according to the position in which the patient is placed. If it is performed while the abdominal muscles are relaxed (*i.e.*, with the knees drawn up), it will retard the secretion of mucus from the intestinal walls and promote absorption—and is most useful in checking chronic diarrhœa.

On the other hand, if the same movement be applied when the abdominal muscles are in a state of tension, it will stimulate arterial circulation and increase the secretion of the intestinal mucus, and is therefore used with great benefit in chronic constipation.

6. *Pressures.*—Pressures are applied to veins and nerves either on the limbs or over the body. Their action, according to NEUMANN, is absorptive. When applied to the veins they induce momentary stagnation of the circulation, causing them to dilate from the pressure of the ascending current of blood. On

the pressure being removed, the blood flows with increased celerity. The duration and degree of pressure depends or the situation or part where it is applied. Vein pressure is used in the treatment of congestion or stagnation. It is a most effective movement, and is usually applied in conjunction with one or other of these exercises, chiefly pehaps with vibrations.

Pressures upon the nerves or nerve centres are supposed by NEUMANN to act upon them in a similar way as vein pressures do upon the veins, *viz.:* that the pressures cause momentary stagnation of their currents or circulation, which on the removal of the pressure, flows on with increased rapidity. Certain it is that in many forms of neuralgia, and in cramps, etc., nerve pressures have a wonderful effect.

The operator in this exercise, when over a large space, uses the palm of his hand and inner surface of the fingers, and presses firmly and steadily over the part; and usually at the same time imparts a slight vibration. In other cases the pressure is performed with the tip of one or more fingers, as when applied to the smaller nerve ganglia.

Surface pressures are applied with the palms of the hands and inner surface of the fingers over the abdominal muscles when relaxed. The operator feeling his way, passes gradually with this movement from an entirely passive to a more or less active exercise of these muscles, and in this way slowly but surely imparts tone and strength to them.

7. *Ligatures.*—Ligatures are a variation of pressures, and are applied round a limb, where it is desired to press upon the whole venous system. It may be performed by the operator grasping the limb with both hands, firmly enough to cut off or arrest the venous circulation; in some instances an ordinary tourniquet

being used for this purpose. It is used chiefly in chronic inflammations.

8. *Flexions.*—The principal object of flexions is the alternate extension and relaxation of the ligaments and fasciæ in and around the joints. Applied passively it acts as an absorptive remedy; when used with a slight resistance on the patient's part it greatly strengthens the muscles, ligaments and fasciæ, round the joints; helping to render them firm and supple. Flexions are used in all the joints, where rotations are possible, and also even where they cannot be used; as in the phalanges, where they are useful in absorbing arthritic deposits, and reducing swellings.

Flexions of the body both anteriorly and laterally, are each attended with distinct results. But in order to carry these out *quite* passively, they would properly be placed under the category or head of what is known as *Liftings.* Here the body remains in a passive recumbent or semi-recumbent position, and is then raised in any of the directions indicated. Dorsal Lifting, or passive flexion is effected by the operator placing the palms of both hands under the body of the patient over the dorsal region, and then gently raising this portion from the couch; leaving the cervical and sacral regions in contact with the couch. This passive body-flexion is useful in expanding and strengthening the muscles and fasciæ of the stomach and abdomen, and thus acting mildly on the circulation of these parts. This passive dorsal flexion or lifting is frequently combined with a vibration, which increases its effect by stimulating the nerves, and promoting the glandular secretion in the bowels.

The Lateral Flexions according to Neumann and others, act regeneratively upon the liver and spleen, and promote successively absorption and increased arterial circulation. They are naturally only used for very debilitated patients, as the active body flexions are usually employed. The passive lateral flexions are used with great success in some cases of lateral curvature of the spine.

9. *Massage.* — This consists in taking a small portion of the flesh between the tips of the fingers and thumb, alternately compressing and relaxing them, so that the small veins under the fingers become emptied of their contents.

This massage, in combination with one or more of the other movements, is very useful in promoting the activity in the capillaries over the whole surface of the body. There are several other passive movements, as muscle kneading, and grasping, etc., having mainly the same purpose in view; as, however, they are only variations, or combinations of those already mentioned, it will not be necessary to describe them in detail.

As examples of combinations of these movements, pressures with vibrations, passive flexions and pressures, and so on, may be mentioned.

Having thus a wide choice of movements, the operator chooses only those suited for the particular result he wishes to obtain, and in so doing he has to consider, in choosing the most applicable,

1st, the strength of the patient.

2nd, the particular form of disease.

3rd, the temperament and disposition of the patient.

4th, the degree of recuperative power, or the amount of response, which is given to any particular movement.

All these considerations have to be weighed and carefully adjusted in the choice of each movement that is used.

II. THE SEMI-ACTIVE MOVEMENTS consist chiefly of the above exercises or movements, but with this difference, that instead of the patient being entirely passive, he or she co-operates, or assists the operator in carrying them out.

III. THE ACTIVE MOVEMENTS of LING are again in advance of the semi-active, as in this case, they are entirely carried out by the patient under the guidance or direction of the operator. It would be beyond the scope of this little book to enter into or describe these active movements, as it would increase its size beyond the prescribed limits, besides, these movements have been accurately described and beautifully illustrated by MISS LEFFLER ÅRNIM, of 2, Hinde Street, Manchester Square, in her "*Health Maps*," (published by Messrs. SWAN, SONNENSCHEIN, LOWREY & Co.), to whom I am greatly indebted for valuable assistance in preparing this article.

The great value of Ling's method is its completeness as a scientific method of cure. It is equally applicable to the young and to the old, and may with advantage be used in cases of extreme debility, bringing the patient by almost imperceptible stages, from a state of grave and alarming weakness to complete convalescence. In chronic diseases, Ling's method is now being slowly but surely acknowledged as one, if not the most powerful, curative agent we have. In addition to their own curative action, these movements greatly assist the action of medicines, and other therapeutic agents, as electricity, Turkish baths, pack, etc.

The following cases may be given as shewing the value of this method of treatment :—

Lateral Curvature of the Spine accompanied by severe Back-ache.

Mrs. S——, although in easy circumstances, devoted a great deal of time to sewing and mending the clothes of her numerous children. Not being very robust, she suffered a great deal from persistent pain between the shoulders, and a sense of lassitude. The pain at last became so bad that she decided to seek advice. On examination a slight lateral curvature was noticeable. A course of Swedish movements was at once prescribed. After a few days of this treatment the wearing, gnawing pain between the shoulders was materially relieved; and before many weeks had elapsed, both the pain and the spinal curvature had entirely disappeared.

ASTHMA AND BRONCHIAL CATARRH.

Mr. T——, had suffered for many years from asthma and bronchial catarrh of so distressing a character that he had been compelled to leave the army. Of late he had been unable to lie down at night, and his rest was further broken by the necessity of constantly inhaling *poudre abyssinie* or other anti-spasmodics. He had tried every kind of treatment, orthodox and quack, but without any permanent relief to his sufferings.

A two months' course of Swedish movements, accompanied by daily applications of the galvanic current (*anode*) to the pnenmogastric nerve, resulted in a complete and lasting cure.*

SPINAL IRRITATION.

Miss ——. This lady after some years of hard work, and mental worry, which had impaired a naturally strong constitution, began to suffer from sleeplessness and great depression, with pains in the back, and nervous twitchings of the legs, especially at night. These at times were so severe that she had to get up and rub her legs, or bathe them in hot water. She had been taking *Bromides*, *Chloral*, and other medicines for months, without any benefit. On seeing her I stopped the *Bromides* and *Chloral*, and gave her instead *Keith's Tincture of Avena*, five to seven drops in a wineglass of hot water two or three times daily—also a tumbler of hot milk three times a day, in addition to her ordinary diet. Massage was also ordered at first twice a day, night and morning, for half-an-hour at each *seance*. In a fortnight this was reduced to about forty-five minutes in the morning. The benefit which followed this treatment soon became noticeable. She had better nights and lost the twitching in her legs in about ten days. The pain in the back was also less. After the Massage had been continued for some weeks, she was able to resume her usual avocations; and up to the present time (an interval of two years) she has continued well, and has had no return of her former troublesome symptoms.

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* This is but one of many cases of asthma being successfully treated in this manner, though in some cases the use of the *cathodal* pole to the pneumogastric yielded better results than that of the anodal. It is a curious fact in the treatment of this disease, that in some instances the anode gives relief, in others the cathode. This, in every case must be determined by experiment.

I am indebted for the following typical cases to MR. JOHN HOLM of 48, Conduit Street, W., and to MISS LEFFLER ARNIM of 2, Hinde Street, W., respectively.

SCOLIOSIS, FEEBLE CIRCULATION AND DIGESTION, CHRONIC CONSTIPATION.

Miss A—— S——, æt: 15, was brought by her mother for examination, in February, 1884. I found that spinal deviation existed in a considerable degree, there being right dorsal and left lumbar lateral curvatures combined with rotation of the vertebra, also the "stooping habit" was present in a very marked form. For these deformities she had been treated for some months by an eminent orthopædic surgeon, who had ordered her to wear a spinal support of somewhat complex character. A condition of contraction of both Achilles tendons also existed, for which the same authority advised tenotomy, stating that while the operation was desirable for both legs it was imperative that the left tendon should be cut, the heel on that side not reaching the ground.

The general health of the patient was bad and described by her mother as having recently broken very much, markedly so, since the use of the instrument, which she did not think had in any degree diminished the spinal curvature. Indeed, as she described it, although the patient remained in a fairly good position while actually wearing the support, she appeared to collapse if it were discarded for ever so short a time.

The circulation was very feeble, and the patient suffered from cold hands and feet.

The digestion was weak, and chronic constipation of an extreme character had existed for a long time.

The young lady was placed under medico-gymnastic (Ling's Swedish) treatment early in March, and attended daily at my gymnasium for three months; she then with varying intervals attended three times a week for three months, and again twice a week for a similar period.

At the outset the spinal support was discarded. Improvement in the strength of the back as well as in the general health was manifested within six weeks from the commencement of the treatment, and continued to progress. The curvature meanwhile gradually diminished, and the back was nearly straight at the end of the year, and both heels well to the ground.

The constipation had gradually yielded and the action of the bowels had become normal. The feebleness of digestion had also disappeared, and the circulation greatly improved.

At the end of the sixteen months over which the treatment with its interruptions had extended, all trace of the spinal deformity had disappeared with the exception that the left shoulder was still slightly higher than the right, and that a little poking forward of the head remained.

In all other respects the patient was perfectly well, and considerably above the average strength of young ladies of her age. I last heard of the patient in the Summer of 1887. No relapse had then taken place and she was then, as I was informed, perfectly straight, well and strong.

Miss Q——, a handsome girl of 20, was introduced to me by a former patient. She had been induced to try a course of LING's applied exercises for the rectification of certain functional irregularities upon which no treatment hitherto had seemed to have the slightest effect. In addition to the special trouble, Miss Q—— was subjected to fulness in the head; very cold extremities; an exceedingly weak digestion; and constipated habit which necessitated the daily use of laxatives.

"I am told my digestion is at the root of all my trouble" she said, "and that if I can get that right I shall be well. But nothing seems to have any effect upon it. My life is a burden to me, for I am constantly being reminded of my digestion. If I eat enough to satisfy hunger I am punished by weight and fulness, and I have to keep myself half-starved, and diet myself most carefully in order to be free from pain."

I found that she had not exaggerated her troubles. Any little exertion, any exercises at first but the absolutely passive ones, brought on that coldness of the hands indicative of exhaustion and so typical of disordered digestion. So the passive exercises were persevered in until the circulation began to grow more normal, the gastric nerves soothed and encouraged, and the need of laxatives gradually lessened.

But the relief produced by the passive movements alone can seldom be said to be permanent. They relieve while the patient is subjected to them daily; but they seldom or never of themselves promote a radical cure. They are, however, very useful, nay, indispensible in preparing the patient to bear what *will* cure her; namely, the semi-active and active exercises.

By the very careful and judicious introduction of the first, we were enabled gradually to establish the good already gained by the passive exercises, and by the daily increase in the power of these, the patient was slowly brought into the *habit* of being well. Functional irregularity became the exception instead of the rule. Miss Q—— began to enjoy a healthy meal, and her weight which had fallen considerably, increased every week. "I do not know myself I feel so well" were the words with which she used to greet me towards the end of her cure. She was with me for three months, and then by the aid of one of the "Health Maps" continued the exercises at home. By my request she has reported herself to me occasionally for several months, and everything tends to show that her cure has established itself permanently. The special trouble is set right and is a trouble no longer, and if she perseveres in the use of the exercises I have prescribed for her for 10 minutes daily, she will in all probability not require my personal aid again.

I have chosen this case out of a number, as showing more distinctly than many do the relative uses of the passive, semi-active and active exercises —how each are useful in their place and by skilful combination, and yet how neither group alone would have secured the result which has been gained. Had Miss Q—— commenced treating herself by the active exercises alone, she would in her feeble condition have aggravated her complaint. Had she been treated merely by passive manipulations, she would only have secured a temporary relief. But to produce permanent valuable effect, the exercises of LING must be used as a whole; and in proportion to the judgment with which the exercises are chosen, and the skill with which they are administered, will rest their success as a curative agent.

CHAPTER IV.

THE HOT WATER CURE."

GENERAL attention was first directed to this method of cure by a series of letters in reply to an article in the *Lancet* of November 28th, 1885, on "The Philosophy of Drinking largely." The letters appeared in *The Pall Mall Gazette* during the year 1886 over the signature "H.W." Previously, hot water has been recommended to be taken with or after luncheon and dinner, instead of cold, especially in cases of dyspepsia. I have frequently advised my dyspeptic patients to sip half a cup of hot water to which one drop of tincture of *nux vomica* has been added, three times a day after meals, and all have borne testimony to the benefit they received. The *nux vomica* must not be continued too long but should be omitted occasionally for a few days, and the hot water taken plain or medicated with some other drug.

DR. J. S. SALISBURY of New York was, I believe, the originator of this mode of treatment. He brought his views on the subject before the profession in 1858. DR. CUTTER and the late DR. JOHN BUTLER were amongst his earliest adherents; each published his experience, one in a medical journal, and the other in pamphlet form. They both fully endorsed DR. SALISBURY'S views as to the beneficial results obtained. DR. CUTTER says "It is the basis of treatment of all forms of chronic disease." DR. BUTLER begins his pamphlet by mentioning the diseased conditions for which he administers his remedy (hot water), and goes on to say that "in consequence of defective digestion and unsuitable and improper foods, certain products, the results of chemical changes, are formed in the stomach and in the intestinal canal. These, if not speedily eliminated, soon become morbific agents. They are soon absorbed into the system, poisoning the blood and interfering with nutrition. These products mainly consist of yeast, lactic, acetic, butyric and saccharic acids, sulphuretted hydrogen, sulphide of ammonium, and carbonic acid gas.

A very little yeast introduced into a stomach already weak will suffice to start fermentation of the food, and yeast fermentation once started tends to perpetuate itself indefinitely. As a result of this fermentation, carbonic acid is set free, which not only paralyzes the healthy activity of the secreting glands of the stomach and intestinal canal, but in consequence of its irritant action on the mucous membrane, originates a catarrhal condition. This, besides keeping the parts in a state of sub-acute inflammation, allows the stomach, the duodenum, and the whole intestinal tract to be continually filled with mucus. Thus their functions are mechanically impeded. It is easy to understand that every meal put into a stomach in this yeasty, slimy, catarrhal condition, tends farther to increase the difficulty. More and more yeast is formed which is absorbed into the blood, healthy nutrition becomes impossible, and that part of the body, naturally the weakest and most over-worked, is the first to suffer ; it may be the heart, lungs, brain, kidneys, or spinal cord, etc."

These products form frequently the starting point of chronic disease, and if not actually so, they are at all events, great aids in keeping up these diseases. They also seriously interfere with the action of the medicines prescribed. Taking this view, the first thing to be done for the cure of these troubles is to get rid of malefic products, and, to accomplish this, the originator of this plan of treatment advises large draughts of hot water, and to avoid as a diet anything likely to induce or keep up fermentation. The large draughts of hot water thoroughly wash out the stomach, and in fact the whole ailmentary canal. DR. CUTTER calls it "an inside bath," and says that "it is the foundation for the treatment of all chronic diseases ; that it executes downward peristalsis," relieves spasms or colic of the bowels by applying the relaxing influence of heat, "dilutes the ropy secretions of the body," dissolves the abnormal crystalline substances that may be found in the blood and urine, "washes down the bile, slime, yeast and waste, and makes the stomach fresh and clean for eating, etc., etc."

In GAILLARD'S Medical Journal, June 9th, 1883, DR. SALISBURY noted that drugs acted more promptly and certainly when a patient was under this treatment. He also found that many diseases which had resisted the usual methods of cure, some absolutely considered incurable, yielded readily to his method, such as chronic dyspepsia, tumours of various kinds, Bright's disease, rheumatism, gout, diabetes, locomotor ataxia, and many heart affections. Even in consumption of the lungs and bowels the benefit was quickly noticed.

Dr. Butler sums up the effects of hot water, combined with an accurately prescribed diet, as follows :—

I. *Noticeable to the patient.*

1. Increase of appetite.
2. Improved digestion.
3. Absence of discomfort after eating.
4. First loss of flesh after partial gain.
5. Flatulence, heart-burn, sour stomach, etc., are cured.

6. The stools become black and remain so until the liver is perfectly washed out. This is due to the bile flowing through the proper channel instead of passing into the blood.

7. The fæces lose their odour.

8. The urine becomes clear, free from sediment and urinous smell.

9. Perspiration starts freely after drinking the water.

10. The skin becomes healthy.

11. Iced water and stimulants are not cared for.

12. A feeling of elasticity and buoyancy of spirits take place, a general sense of improved health is soon apparent.

13. The cough, night sweats, and diarrhœa of consumption diminish, and are finally cured.

14. Fœtid perspiration disappears.

II. *Noticeable to the physician.*

1. By microscopic examination of the blood, it is noticed that (*a*) yeast is

diminished and ultimately eliminated, (*b*) clots are got rid of, (*c*) excess of fibrine diminished, (*d*) stickiness or adhesiveness of the blood corpuscles is lessened, and the red corpuscles assume a healthy appearance; (*e*) crystals of cystine, stearine, oxalate of lime, phosphates and other abnormal products are washed out, *(f)* parasitic spores and filaments from day to day decrease, and are ultimately destroyed.

2. By microscopic and chemical examination of the urine it soon becomes manifest that the secretion of albumen when present is at first lessened and finally ceases. The same is true of casts, abnormal, earthy and saline deposits, and also of sugar.

3. Examination of the sputa shows improvement in the lung diseases, expectoration of the fibre of the lung which exists in the sputa of consumptives, becoming less and less and finally disappearing. The same is true of the

gravel of the lung as it is called, the truth of which is easily verified by the microscope. Besides all this, dieting and the use of hot water make one thing very apparent to the physician, which is, that *drug remedies, which at first were useless, although strongly indicated, now act promptly*, and to those unaccustomed to witnessing this mode of treatment, with marvellous rapidity.

H.W., in his little pamphlet "*Hot water as a remedy*," and also in a letter to *The Pall Mall* gives his experience as follows: ". . . My case was a comparatively mild example of a class of ailments, which I have since learnt to be very large, and I can state it quite shortly.

On the first day of 1884 I had a very painful attack of what turned out to be renal calculus (kidney gravel); this was repeated several times in the same week, and then at intervals of about two months until the September following. I am nearer fifty than forty, have always lived plainly and regularly and been nearly a total abstainer. I am 5ft. 11in. in height, and at the time of my first seizure I weighed 16 st. 4 lbs. in my clothes, or about 15 st. 5 lbs. net, and measured 44½ ins. round the waist and 42 ins. at the chest; I have been too stout for my height for twenty years, but rarely suffered from anything but indigestion evidenced by very frequent attacks of heart-burn. On the renal trouble appearing, my family doctor, for whom I entertain the very highest respect, immediately stopped my eating beef, restricting me to fish, fowls, vegetables and occasionally a little well-hung mutton, and prescribed lithia water for drink; by his advice I went in August 1884 to take the sulphur baths and drink the waters at Strathpeffer in Rosshire. Up to that time this lowering diet had created no improvement, as an attack I had on the first of July was the very worst of all; and the course at Strathpeffer—so far as I could judge—did me no good. At the end of August I was fortunately asked to go to America on a matter of professional business, and while there I had a somewhat mild attack on the 18th of September. In New York I met an old friend, who, after learning the state of my health, advised me to consult a Dr. Butler, who had treated him, his daughter, and a great many other people he knew in what appeared a very extraordinary fashion, but with the most gratifying success. I did as I was advised, duly received certain instructions and having satisfied myself that no harm had been known to result from the treatment, started a course as soon as I could after my arrival at home. This course consisting in drinking almost nothing but hot water, and eating practically nothing but animal food for seventeen weeks.

The water was taken in four doses per day at a temperature of from 130° to 150° Fahr. on an empty stomach, and at least one hour before a meal. The first I took at 7 a.m., second at noon, third at 5 p.m., fourth at 10 p.m., and a pint to a pint and a quarter each time. Lean beef steak, freed from fat, skin and connective tissue, was recommended as the model food, and this formed 75 per cent. of all I ate during 121 days; the remainder being plain boiled cod fish and occasionally a few sticks of celery. During nearly the whole time I did not have a bit of bread, or any other vegetable, except a little pepper, mustard and horseradish as condiments. I was advised that I must eat at least 4 lbs. of beef per day, and as closely as I can estimate my daily average of solid food through the course was 5lbs."

. . . . . .

". . . The results in my own case are simply these. On the 11th of October, 1884 (having then been somewhat reduced by the starvation treatment my own doctor advised), I weighed 200 lb. net. By the 31st December I had lost 39 lbs., bringing me to 161. This was the irreducible minimum, for although I continued the same course until the 8th of February I got no lighter. At the latter date I began to eat a little rice with my beef, and gradually worked, as directed, into a regular diet of two parts of animal to one of vegetable food, and this I have as nearly as possible maintained ever since, continuing also the early morning and noon dose of hot water every day. I have not had the slightest touch of heart-burn since I began, fifteen months ago, and so far as I can judge the kidney trouble has entirely disappeared."

In carrying out this course the following general directions must be adhered to. The diet and amount of hot water to be taken is more or less varied according to the disease and condition of the patient, the quantities varying according to the constitution or age of the patient; also by the state of blood and urine microscopically and chemically analysed.

GENERAL RULES.

1. *Time for taking.* The hot water to be taken one to two hours before meals, and an hour before bedtime.

2. *Quantity to be taken.* From a pint to a pint and a quarter till the specific gravity of the urine in the morning is from 1015 to 1020; if 1015 or below, less hot water to be taken, if above 1020, more.

3. *The temperature of the hot water.* As hot as can be borne, at least 110° Fahr. Many people take it much hotter

and some can bear it 150° Fahr. Tepid water only nauseates without doing any good.

4. *Method of taking.* In sips or swallowed slowly.

5. *At meals* a small cup of tea, coffee, beef tea, or hot water.

DIET.

The diet should consist chiefly of meat (preferably beef) either roast or boiled, and fish (better hard white fish, as cod, haddock, etc.); pastry pickles, pancakes, jam, sugar, vinegar, everything fried with butter, ice cream, cheese, and fermented drinks to be avoided. The patient must eat slowly, and take meals at regular hours.

As a general rule, roast and boiled meats (not veal or pork), fish, oysters, poultry and game may be taken, as much as desired. All the fat, skin and tendon to be removed. The following may be taken in moderation: fresh butter, boiled rice, potatoes baked in their jackets, thoroughly baked bread, celery, apples, pears, peaches, raspberries, oranges, etc., eggs now and then (they should be lightly boiled or poached). Among the articles of diet that must be rigorously avoided are : pork, veal, salted or smoked meats and fish, oily fish and poultry, as eels, salmon, tame ducks, etc., puddings, jams, pickles, nuts, cakes, pastry, etc., also anything fried or iced, cheese, seasoned dishes, etc. ; lemon juice to be used instead of vinegar, in fact anything capable of producing or keeping up fermentation, must be eschewed.

No absolute or general rule can be laid down as suitable to all cases, but each one must be judged and treated on its merits.

I have found this mode of treatment very successful in cases of gout, rheumatism, obesity, dyspepsia and many other diseases ; I have met with great success in many cases that have resisted the usual methods of cure, and can confidently recommend the hot water cure as a most useful adjunct to the ordinary therapeutic agents.

As illustration of the benefit of this mode of treatment, I give two or three cases taken from my note book.

Mrs. ——, about 57 years of age, had for some years suffered from severe dyspepsia with great acidity, heart-burn and flatulence, this increased to such an extent that for several months previous to my seeing her, she was obliged to sit up a greater part of the night spitting up sour acid mucus and water. This was hardly, if at all relieved, by the most careful dieting. She had been forbidden to eat any meat and was only allowed chicken, fish, broth, milk, etc. I at once put her on the full hot diet : fish and meat and a little celery ; she also had a pint of hot water an hour to an hour and a half before each meal. Mrs. —— responded to the treatment like a charm, the second night she was able to sleep without being disturbed by her usual attacks of acidity. The flatulence also disappeared; although very stout before beginning this course, at the end of a month she had lost several pounds in weight, and became less unwieldy. After three weeks of strict diet, I gave in addition DAHL's digestive cakes, toast and some vegetables; in another three weeks she returned to her ordinary diet, and has since remained quite well. I may mention that the principal medicine I gave in this case was *creasote.* I also used an induced current from a primary coil made of very thick wire (2 mm. diameter), which entirely removed a very unsightly and protuberant abdomen.

RHEUMATISM AND SCIATICA.

Miss A——, a teacher, aged 29, had suffered for two or three years with rheumatic swelling of the joints. The knees, when I first saw her, were much swollen, puffy and very painful. She walked with difficulty, her rest at night was broken and disturbed owing to pain in the joints and down the course of the sciatic nerve. Her health had given way from pain, sleepless nights and the constant anxiety of failing health and inability to pursue her professional duties. I put her at once on the strict hot water treatment, and ordered her Davis' Tonic Gout and Rheumatic powders,* one to be taken in a cupful of water every morning. The beneficial effects of this treatment soon became apparent to all. She soon walked with less difficulty, the puffiness of the knees, etc., diminished, and she was able to rest well at night. After a course of six or seven weeks she was sufficiently well to give up her treatment. She is now quite well and able to follow up her duties with ease and comfort. On two or three occasions (during the past eighteen months) she has been threatened with a return of her symptoms. She then resorted again to her former treatment, and on each occasion in less than a week was restored to health.

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* These powders I have found most useful in all diseases of a gouty and rheumatic origin, they may be obtained from Mr. R. Davis, 20, Maddox Street, W.

GOUTY BRONCHITIS.

Mr. B——, 64 years of age, of a gouty diathesis of full habit and inclined to be stout, had suffered from bronchial colds. These attacks usually came on in October or November and lasted off and on till April or May, sometimes being so bad as to keep him confined to the house for two or three weeks at a time. The cough was always troublesome, and he was forced to wear a respirator whenever he went out of doors. I ordered this gentleman "the hot water treatment" and one of DAVIS' gout and rheumatic powders to be taken in the morning. His general health began to improve at once, his cough lessened, and in less than two months he was quite well. He also was able to do without the respirator, and could go out in all kinds of weather and at night without any inconvenience. He has had no relapse for nearly two years.

BRONCHIAL CATARRH AND DYSPEPSIA.

The Rev. T—— C——, 54 years of age, plethoric, came to me in July, 1888, complaining of hoarseness, a spasmodic cough with shortness of breath; he also was greatly troubled with dyspepsia and flatulence, probably owing to his excessive fondness for tea. The hoarseness and cough followed a severe cold he caught early in January, and which, as he said, he had been "unable to throw off."

This gentlemen was also put on "the hot water treatment." For the cough I ordered a spray of *sticta pulm*, and an inhalation of tincture of *benzoin*. I also prescribed small doses of *bichromate of patash* and *lycopodium*, the former during the day and the latter night and morning. In a week his cough had disappeared, and his digestion greatly improved. I then ordered him *nux vomica*, to be taken three times a day in a wine-glass of hot water, to be sipped after meals ; this completed the cure.

Did space permit, I could report several cases of obesity where the excessive corpulence was materially reduced in six or eight weeks by this method of treatment.

CHAPTER V.

ELECTRICITY.

OF all the auxiliary methods there is none in any way to be compared to Electricity. It is alike useful in medicine and surgery. In the former giving relief, and restoring the patient to health after other means have failed; in the latter frequently taking the place of the knife, and in a harmless and almost painless way replacing a serious and dangerous operation. The intra uterine treatment of FIBROIDS as described by APOSTOLI may be cited as an example.

In a book of this kind, nothing more than a brief sketch of this important therapeutic agent can be given.

The principal forms of this force in use as a medical agent are the (1st) Static or Franklinic, (2nd) Galvanic, and (3rd) the Induced or Faradic.

1st. *Static or Frictional Electricity*—The usual electrical machine for producing this form is very simple, its essential parts being three, viz., the rubber, the rubbed body and the prime conductor. The rubber is usually a pair of leather cushions amalgamated with a paste made of zinc and tin turnings rubbed down with mercury and and lard; the rubbed body, a large circular plate of glass, mounted on a glass axle, and turned by a handle between the cushions; and the prime conductor, usually an insulated metal cylinder intended to receive the kind of electricity required. This form of electricity is ordinarily used for medical purposes in three ways, viz., the electric bath, electrization by sparks and the Leyden jar. The electric bath is of two kinds, electro-positive and electro-negative. The former increases the vital forces, the latter decreases them. In the electro-positive bath the electricity is gathered from the glass-plate on to the prime conductor, while the negative electricity is carried away by a chain from the cushions to the floor. The patient being placed on an insulated stool or chair, is connected with the prime conductor. The whole surface of the patient's body is thus charged with positive electricity, while the surrounding air is rendered negative. If the electric bath be given in a dark room a luminous appearance is produced by the escape of electricity into the air. The electro-negative bath is given in the same way, with this difference : the negative electricity from the cushions is collected, while the positive is liberated and carried to the ground by a chain. The electro-negative is said to have a weakening effect by reducing the natural electricity of the patient, acting like blood letting, the pulse being retarded.

These baths have been found useful in old standing tics, sciaticas, unpleasant flutterings about the heart depending on weak innervation; and tremor of the limbs has been removed, by simply charging a patient as it is called, even when the other forms of electricity have failed.

Electrization by sparks. — The patient is charged in the manner just described as an electric bath. The operator brings his hand near the patient, his hand becomes negatively electric. The negative electricity of the hand combines with the positive electricity of the patient; this produces a flash of light accompanied by a snap, which is called the electric spark. These sparks may be drawn from the body by metallic and other conductors, and produce a sharp pricking at the part; if continued the skin becomes reddened, and white wheals are produced. In large institutions such as hospitals there is a chain or movable wire suspended from the ceiling and connected with the ground, to which is attached a brass ball which slides up and down the wire. This is brought close to the patient, about an inch from the spine ; the patient is now charged, and the ball passed up and down in a line with the spine ; sparks pass to the ball and thence to the ground by the wire. In this way a rapid succession of sparks can be obtained. CAVALLO has recommended the drawing of the sparks through flannel. If the sparks follow each other rapidly, they cause slight vibration of the muscles which are close under the skin. This form has been used with success in paralysis, chorea, amenorrhœa, and in some spasmodic affections. It is also of much value in phthisis in the early stages, in hysteria and many other diseases.

The Leyden jar is charged as follows: you hold the jar by its outer coating, and bring the knob which is connected with the inner coating to the conductor of an electric machine in action. The inner coating becomes charged with positive electricity and the outer coating with negative. If these two coatings become connected, neutralization of the two electricities takes place, and the jar is discharged. For medical purposes it is used as follows: A conductor communicates with the inner surface of the jar to the part to be electrified, the outer surface is connected to the opposite side, a spark is produced and the neutralization of the opposite electricities takes place through the part of the body between the two conductors. . . . Now, however, this kind of battery has been replaced by the more reliable induction machines of which the Wimshurst is undoubtedly the best.

2nd. *The galvanic*, or as it is sometimes called *the constant or continuous current.*—This form is the result of chemical action, or rather decomposition, and is generated in a cell, battery, or pile, where two metals, an electro-negative and an electro-positive, are brought together in an exciting solution. This current produces no shock to the patient, unless broken or interrupted, which may be done either by the rheotome or by an interrupting handle. If weak, the current produces little or no pain ; if, however, it be strong, it causes a tingling, burning feeling at the point of contact, with the electrodes. If very strong, it becomes unbearable. The characteristics of this form of electricity are comparatively low "intensity," in its action on nerves and muscles, but a large amount of quantity. It produces results on temperature, chemical and thermic, far beyond static and faradic electricity.

3rd. *Faradic Electricity.*—This form of electricity is of very high tension, having almost no chemical action or any direct effect on the temperature. It produces no burning or tingling as with the galvanic. It produces contractions of the muscles, and has a decided effect on the nerves of sensation and motion. It is an induced current, and is of momentary existence, but these momentary currents may be repeated slowly or quickly. It exists only at the moment of making or breaking the galvanic current, or at the moment of making or unmaking a magnetic condition in a piece of metal. Having given a slight sketch of the various kinds of electricity, I shall now mention some rules on the modes or methods in which this remedy is used, as, without a proper knowledge of its administration, more harm than good may be done.

Rule 1st.—The positive pole is less irritating, we therefore place the negative pole in general faradization at the feet or coccyx, or at the pit of the stomach in central galvanization, the positive being applied to the head, neck, spine and other sensitive parts.

Rule 2nd.—In cases where the sedative effects of electricity are indicated, the positive pole is preferable, being less irritating.

Rule 3rd.—Where the stimulating effects are indicated, use the negative pole as being the more irritating.

Rule 4th.—Dose of electricity, *i e.*, the strength of the current and length of *seance*, depends greatly on the size and quality of electrodes, and the method of application, whether local or general. A short *seance* of general faradization or central galvanization will have a much greater general effect than a long *seance* of local electrization. If local, a short mild application to the head will produce results (whether beneficial or harmful) that would never occur in one ever so prolonged and strong to the extremities.

Now, not having any definite measure, we to a great extent depend on the sensations of the patient; *i.e.*, if strong currents are borne without uneasiness they are indicated, if only mild ones are easily borne, use mild. A long *seance* with a mild current is much more benfiecial than a short one with a strong current. Sudden shocks, especially with a strong current, often do harm. When using the galvanic current, do not allow the electrodes to stay too long in one spot, or a tedious ulceration may by the result. The good effects of electricity may be roughly stated as follows:—

1st. Relief of pain.
2nd. Improvement in the pulse.
3rd. Improvement in temperature.
4th. Improvement in digestion.

5th. Improvement in the nutrition.

6th. Increase of appetite.

7th. Quieting effect and tendency to sleep.

Gentle perspiration is an evidence of the proper application of electricity, but profuse perspiration shows an excess of irritation, and indicates that harm has been done instead of good.

If the current be too prolonged or too severe the patient is apt to suffer from disagreeable symptoms, *e.g.*, dizziness, heaviness, oppression, headache, soreness, exhaustion, and a sort of undefinable nervousness. MESSRS. BEARD and ROCKWELL in their work give a very exhaustive article on the differences between the galvanic and faradic currents and the special advantages of each, from which I condense the following :—

The advantages of the galvanic over the faradic are :

1st. A greater power of over-coming resistance. It therefore affects the brain, spinal cord and sympathetic more powerfully than the faradic; it is usually prefered when it is desired to effect the middle and internal ear, or the retina and muscles of the eye.

2nd. A power of producing muscular contractions in cases where the faradic fails. This is especially noticeable in paralysis, the muscles responding to galvanism when quite insusceptible to faradism. After treatment by galvanism the muscles often answer to faradism.

3rd, A more potent electro-tonic, electrolytic and thermic action. The chemical power of the galvanic current is most markedly seen in galvano-cautery and electrolysis. Its greater catalytic action makes it superior in cases of neuralgia, atrophied muscles, rheumatism, etc.

The advantages of the faradic current over the galvanic are :

1st. By virtue of its frequent interruptions it more easily produces muscular contractions. This advantage is best appreciated in general faradization, the powerful tonic effects of which are largely due to the passive exercise and consequent oxidation and other important changes of tissue that result from the several thousand muscular contractions that take place during an ordinary sitting.

2nd. It produces great mechanical effects. These are due to its rapid interruptions, not only on the muscles but also on the contractile fibre cells, thus stimulating the circulation and, with it the process of waste and repair. In this respect its action is similar to rubbing, pounding, shampooing, etc. These mechanical effects are especially indicated in the treatment of diseases of the abdominal viscera, (which are supplied with contractile fibre cells), anæsthesia, and general muscular debility, constipation, etc.

The general differential indications may be thus summed up.

The Galvanic should be used :

1st. To act with special electrotonic and electrolytic power on the brain, spinal cord, sympathetic or any part of the central or peripheral nervous system.

2nd. To produce contractions in paralyzed muscles that fail to respond to the faradic.

3rd. In electro-surgery to produce electrolysis or cauterization.

The Faradic should be used :

1st. To act mildly on the brain, spine, sympathetic, or any part of the central or peripheral nervous system.

2nd. To excite muscular contractions wherever the muscles are not so much diseased as to be unable to respond to it.

3rd. To produce strong mechanical effects.

The majority of cases, however, may be best treated, not by one current exclusively, but by both currents, either in combination or alternation or succession. The differential action of the two currents may be roughly compared, according to Dr. Poore, to the action of bromide of potassium and chloral hydrate—the faradic current being the bromide of potassium, and the galvanic the chloral hydrate. Bromide of potassium is a safer remedy than chloral hydrate, but there are very many cases where it is powerless, and the chloral acts as a specific, so the faradic is safer than the galvanic, and therefore better adapted for general use, and, for those who use but one current, fulfills a larger requirement; and yet there are many cases where it fails, and the more powerful galvanic current is required. Except in cases where the galvanic current is clearly indicated, it is well to begin. with the faradic—just as we use the bromide before resorting to the chloral. A combination of the bromide and chloral is frequently more effective in producing sleep and relieving pain than when either remedy is used alone; similarly a combined or alternate use of the galvanic and faradic currents will accomplish much more than either used exclusively."

Faradic electricity has been proved lately to be very useful in arresting uterine hæmorrhages, as menorrhagia and post partum hæmorrhage. It has been lately much employed during labor for atony of the uterus, and has been successful in producing strong and regular contractions. This is a very great advantage, as it has no deleterious effect on the child, as is often the case where ergot has been employed. It has been strongly recommended as a means of resuscitating asphyxiated newborn infants, and in cases of drowning.

Electricity may be administered locally for purely local complaints. Where, however, a constitutional effect is required, the general faradization (for the faradic current) or the central galvanization (for the galvanic current) introduced and fully described by MESSRS. BEARD and ROCKWELL, must be employed.

Localized Electrization.

The object of localized electrization is to confine the direct action of the current, so far as possible to some particular part of the body. This is accomplished by placing electrodes so that the current in passing from one to the other shall chiefly traverse only that particular part that is to be affected.

There are two general methods of localized electrization—*direct* and *indirect*: Direct where the application is made over the muscle to be excited; indirect where the application is made to the nerves supplying the muscles. In the former, large electrodes are used; in the latter, small pointed ones. The faradic is best for direct; the galvanic for indirect. In stabile applications the electrodes are kept stationary, in labile, one or both electrodes are moved over the surface.

General Faradization.

The object is to bring every portion of the body under the influence of the faradic current, so far as is possible, by external electrization. This is best accomplished by placing one pole (usually the negative) at the feet or the coccyx, while the other is applied over the surface of the body.

Central Galvanization.

The object here is to bring the whole central nervous system, the brain, sympathetic and spinal cord, as well as the pneumogastric and depressor nerves under the influence of the galvanic current. One pole, the negative, is placed at the epigastrium, while the other is passed over the forehead and top of the head, by the inner border of the sterno-cleido mastoid muscles, from the mastoid fossa to the sternum, at the nape of the neck and down the entire length of the spine.

Applications of electricity may also be administered in the form of baths; (as the electric bath and the electro-vapour bath); or in the form of a belt.

The Electric Bath.

The bath tub is made of some non-conducting substance as slate, delf, wood, etc. Wood has the advantage of being cheap, and is quite as good as the other more expensive materials, as marble, slate, etc., for therapeutic purposes. At the head and foot of the bath, carbon plates are let in; these are connected by copper wires, which run along groves let in at the head and foot pieces of the bath to the coping where they communicate with two binding screws, to which are connected the wires from the battery. If the positive pole of the battery is connected to the head of the bath and the negative to the foot, we get a descending current. When this is reversed an ascending current is obtained. If we wish to localize the current on special parts of the body what is called a surface board is used. This is a piece of board about 15 inches long, 5 inches broad, and about $\frac{3}{4}$ inch thick, having a bed cut into it large enough to receive a carbon plate 5 inches long, 2 inches broad, and $\frac{1}{4}$ inch thick; through the centre of the board a metallic binding screw is introduced and brought into contact with the carbon. To this binding screw may be attached a wire from either pole of the battery. The current is said to be centripetal when the surface board is connected with the negative, and centrifugal when connected with the positive pole, the other pole of the battery being attached to the binding screw at the head of the bath. The duration of the bath ranges from 10 to 30 minutes.

Electro Vapour Bath.

This is simply a pulpit vapour bath so arranged that either the seat or foot piece (on which the patient's feet rest) or both are connected with one pole of the battery—the other pole is connected with a large sponge, which the patient passes over the chest, loins, stomach, abdomen, etc. The vapour of the bath may be impregnated with some drug as *eucalyptus*, *etc.* It is claimed for this bath that ozone is given off, but this is very doubtful, at least in any appreciable quantity.

The Electric Belt.

This consists of a belt varied in shape according to the maker's taste, and in which are situated one or more cells. By far the best (in fact the only reliable one in the market) is that manufactured by MR. THISTLETON, 1, Old Quebec Street. W.

ELECTRICITY AS A SURGICAL AGENT.

I propose only giving the briefest sketch of some of the surgical uses of electricity, with a few cases to illustrate its application. A thorough knowledge of "Ohm's Law" is absolutely necessary to scientifically and successfully operate with the galvanic current. $C=\frac{E}{R}$, that is the current equals the electromotive force divided by the resistance. The current is measured in ampères, the electromotive force in volts, and the resistance in ohms.

ELECTROLYSIS (*ἤλεκτρον and λύω*)

If the poles of a galvanic battery are inserted into living animal tissue by means of needles we notice the following phenomena; the blood-vessels become dilated and engorged when a weak current is used. If however a stronger current is employed the following phenomena take place in direct ratio to the strength and duration of the current. The albumen of the part coagulates, the water becomes decomposed into its original component gases, the oxygen appearing at the positive and the hydrogen at the negative pole, in their passage separating, tearing apart and destroying the intervening structures, such as muscle fibres, cells, nuclei, etc.; again the salts are also decomposed into their component parts, alkalies and acids, the former being attracted to the negative and the latter to the positive pole, each acting as an escharotic and producing sloughing. Thus by its contained reagents, the part acted on, helps to destroy itself. This process is divided by Dr. Butler into four stages :

1. The dynamic or absorbent stage.
2. The coagulating stage.
3. The stage of mechanical disintegration.
4. The escharotic stage, or the stage of complete and ultimate electrolysis.

The effect obtained by the first stage is sufficient for the treatment of serous effusions, recent soft strictures, etc. The second stage is applicable where simple coagulation of the blood is all that is necessary, such as aneurisms, piles, varicose veins, etc.—where however the destruction of growths is required, as in the case of cancer, fibroids, etc., the electrolytic action must be pushed to the third or fourth stages. A good galvanometer in the circuit is absolutely necessary in order to measure the strength of current required.

Cystic tumours, such as hydrocele ovarian tumours, cystic goitre can be successfully treated in this way.

The great advantage of removing malignant tumours by electrolysis is, that the tendency to return is greatly diminished. There are many instances where a malignant growth having returned after an operation by the knife, and being then removed by electricity, the patient recovered and no tendency towards recurrence has appeared, although the patients have been under observation for several years. If the growth be very large it is perhaps best first to remove it, and then thoroughly to electrolyse the wound. The various modes of procedure in operating by by electrolysis are too lengthy to explain in detail, and would be beyond the scope and aim of this little book. I am, however, preparing for the press a handbook of electricity which I hope will be ready by the end of the year, where these details will be fully treated.

I may mention a few diseases in which electricity as a surgical agent has been proved to be of the greatest possible value in restoring the patient to health. In piles the cure is rapid, permanent, and devoid of the many disadvantages of ligature, clamping, etc. Its value in the treatment of synovitis, enlarged glands, strictures, cystic tumours, moles, polypi, mother's marks, malignant growths, fibroids, ulcers, etc., can hardly be over estimated, and lastly, the medical man will appreciate its use in removing superfluous hairs from the face. By means of electricity this great annoyance—especially to ladies—may be easily and permanently removed.

I will now give a few cases out of many I have in my note book.

HAY FEVER.

Mr. H—— entirely escaped his usual attack during the past summer, having, at my advice, undergone a systematic course during the summer months. He assured me that, in addition, he felt much stronger and more able for his work. Last summer was the first for many years he passed with any comfort, having been usually obliged to spend June, July and part of August either at the sea-side, or at one of the mountain retreats frequented by victims of hay fever. I may mention here that I have been successful in cutting short several severe attacks of this disorder; treating them by central galvanization.

APHONIA.

Miss G—— B——, aged 18, came to me in April. Had been in a somewhat debilitated condition for some time, menses irregular, bowels very constipated. About three months previous to her visit to me she had caught a severe cold, which resulted in complete loss of voice, so much so that she carried a slate and pencil as a means of communication. A laryngoscopic examination revealed paralysis of the vocal cords; on attempting to phonate, the right remained completely motionless, and the left did not quite approach the median line. I applied one pole of the faradic battery over the larynx by means of the usual necklet, and the other directly to the vocal cords with the laryngeal electrode. The effect was instantaneous, her voice being completely restored. I then ordered her a tonic containing *iron* an *nux vomica*, and she shortly regained good health.

INFANTILE PARALYSIS.

Frank M——, 14 months old; strong, well nourished child. First seen, September 24th, 1886, left leg was paralysed, muscles flabby, limb was always cold, and smaller than the right. Previous history: Sept. 14th, child woke up, crying, after its morning nap; was very feverish and vomited several times. The mother gave it a dose of oil; towards evening child seemed better. The next day the mother noticed the child's leg was paralysed. Supposed cause of the paralysis was cold, as the child was sitting on damp grass the day before its illness. There was no response to the faradic current. *Treatment.* —

Galvanic current, positive pole to the lower part of the spine, negative applied to the entire length of the limb. Early in October the muscles began to answer to the faradic current; a fair return of sensation; temperature of the limb better. Continued galvanism, and, in addition, gave faradic baths. In October the leg had increased in size, and was easily kept warm. The child now began to move the leg, and was able to creep and stand in November. In December the leg was the same size as right; able to walk short distances; dismissed, cured, towards end of December.

LUMBAGO.

Colonel B—— consulted me during an attack of lumbago. He had been suffering nearly a week, and was scarcely able to cross the room so great was the pain. I applied a galvanic current over the spine and hips for about fifteen minutes; this greatly relieved the pain. Next day I repeated the galvanism with the effect that he could now walk with a stick. Three more applications completed the cure.

DEFICIENT SECRETION OF MILK.

Mrs. H——, for the third time consecutively, suffered from entire absence of milk in the right breast; probably the result of previous abscesses. Three applications of the induced current were effectual in producing a full supply.

TOOTHACHE.

I have several times afforded great relief by placing a needle connected with the negative pole of a galvanic battery in the hole of the carious tooth, the positive being placed on the cheek, and passing a gentle current through for a minute or two. Two or three applications, allowing a few minutes rest between each, will, as a rule, cure the toothache. The patient will not be likely to suffer from a return for some weeks, or months.

FIBRO-MYOMA OF UTERUS.

Miss ——, Dublin, consulted me May 30th, 1886. On examination I found an interstitial fibroid tumour, about the size of a large hen's egg, on anterior aspect of the uterus near the fundus. The patient presented a blanched appearance owing to excessive hæmorrhage. She was very weak, her appetite was very poor, and she suffered greatly from constipation. Her period lasted ten to fourteen days, and returned every two or three weeks; the loss at times amounting almost to flooding. May 31st: I commenced treatment with the positive pole of a galvanic battery passed into the uterus by means of a properly insulated platinum electrode, and completed the circuit with a large sized pad, composed of modellers' clay, over the abdomen connected with the negative pole ; the strength of the current used was 60 "milli-ampères." The *seance* lasted about ten minutes, and was repeated every other day for a week, when I increased the current to 70 "milli-ampères," and then gradually increased the current to 100 "milli-ampères," repeating the application about three times a week, continuing it for another four weeks. The tumour was now reduced to about the size of a walnut, or less, and gave no further trouble, the period being normal, and the appetite improved. She quickly recovered her health, and is still strong and well, having had no return of any of her former symptoms.

RECURRENT CANCER (*Scirrhus*).

Mrs. H——, 45 years of age, consulted me about a lump in her right breast. She had had her breast removed nine months previously for cancer at one of the general hospitals, and the present lump was growing from the cicatrix of the old wound. It was hard and about the size of a walnut. I passed a spear-shaped electrode, attached to the negative pole of a galvanic battery into the healthy tissue beneath the growth, closing the circuit with a broad sponge electrode, and using a current strength of 50 "milliampères. I made a second application in about a week with a prong, or sharp-pointed electrode.

Subsequently, to keep up the action, two applications for about a month were made to the sore with a metallic disc attached to the negative pole and an ordinary sponge to the positive pole, placed close to the breast. The nodule sloughed off, the sore healed, and after the lapse of a year she had had no return of her trouble.

HÆMORRHOIDS.

Mr. R— had suffered with hæmorrhoids for several years, and to add to his trouble, one or two would sometimes come down while walking in the street, compelling him to go into a shop or hotel to replace them. In fact, the patient's life had been a misery to him for two or three years. He had an objection to the usual operation, as he was a nervous man, and dreaded anything like an operation with a knife or ligature. When I suggested removing them by the electro-cautery he at once agreed, and I operated the following day. He was placed under the influence of ether, and I punctured each pile to its centre with a conical electrode at a dull red heat. The hæmorrhoids were then smeared with vaseline and returned;

they sloughed away in three or four days, and my patient went out for a walk in ten days, and then returned to his occupation in good health and spirits, and has not suffered since.

REMOVAL OF SUPERFLUOUS HAIRS.

Mrs. —— consulted me about hairs growing on her chin and upper lip, the hairs on the chin being coarse and black, and so disfiguring that she was forced to shave. I had several sittings and removed them by electrolysis. Some few returned and were afterwards removed, and there has been no subsequent growth. I operated as follows:—The positive pole was connected with a flat broad sponge electrode, placed on the nape of the neck and kept in place by a piece of tape; the negative pole was connected with a handle holding a sharp triangular or bayonet shaped needle; this I held in my right hand. In my left I had a pair of ciliary forceps, with which I laid hold of a hair, and placing the needle in contact with the skin, at the point of exit of the hair, allowed it to enter into the hair bulb by its own weight and accompanying electrolytic action. In a second or two, a white viscid froth appeared around the needle, the hair became loose, and was taken away without any effort. I may mention that before removing the needle I gave the handle a half-turn, which brought the sharp edges against every portion of the hair bulb, thus ensuring its complete destruction.

PROTUBERANT ABDOMEN.

Mrs. ——, a fine handsome woman, was much distressed by a very large and protuberant abdomen, which greatly marred her appearance. I applied a strong current from a primary coil made of coarse wire (2 mm. diameter) by means of two large pads. Four or five applications were sufficient to reduce the abdomen, much to her gratification, to a normal size. I have had many of these cases and find that from two to six such applications are sufficient to reduce these ungainly enlargements.

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